

Expansion and diversification of medical education in Australia, 1951–2000

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THE SECOND HALF of the 20th century has seen medical education in Australia break free of the traditional education model inherited from British medical schools and become one of the most diverse and dynamic medical education environments in the world. The number of medical schools has increased from four to eleven, and changes in curricula and admission criteria have been instigated predominantly by the newer schools. The eleven schools provide a range of learning experiences and duration of courses, from five- or six-year courses entered directly from secondary school to four-year graduate-entry courses. This diversity will equip us well to take on the challenges of globalisation of health education in the 21st century, particularly in Asia.

A key factor in some of the changes in medical education in the past 50 years was the increased university funding by successive federal governments in the 1960s and 70s, with the aim of making Australia a "clever" country. Facilities within medical schools were expanded considerably and several new schools were developed. Clinical departments were accommodated in or near teaching hospitals and the increased funding provided the opportunity for important staffing initiatives — the creation of full-time academic units in clinical sciences and the appointment of full-time deans to the medical schools.

A second key factor was the establishment, in 1985, of the Australian Medical Council. One of its main functions was accreditation of medical schools and courses involved in basic medical education.¹ Until that time, the British General Medical Council (GMC) accredited our medical schools, which allowed Australian medical graduates to register in the United Kingdom without further examinations. Having our own accreditation body released Australian medical schools from the course constraints imposed by the GMC (a primary medical degree of not less than five years).²

Diversification of medical schools and the Karmel Report

The number of medical schools in Australia has almost doubled in the past 50 years (Box 1). Although the four medical schools established from 1956 to 1963 (at the University of Western Australia, Monash University [VIC], the University of New South Wales and the University of Tasmania) were considered innovative, it was not until the medical school at the University of Newcastle (NSW) was

ABSTRACT

Australia's present diverse and dynamic medical education environment has been shaped by:

- university funding increases by governments in the 1960s and 70s to promote Australia as a "clever" country;
- the Karmel Report's recommendations of increases in student numbers, new medical schools and a community focus for medical education;
- the successful innovations in entrance requirements and curricula of the most recent medical schools — Newcastle and Flinders;
- the formation of the Australian Medical Council, with a mandate to replace the British General Medical Council's accreditation of and restrictions on Australian medical school courses;
- the Doherty Report, which identified the close relationship between medical education, funding and workforce issues;
- the change to graduate entry and a four-year course for several Australian medical schools; and
- changing patterns of healthcare delivery, the imperative for increasing access to healthcare in rural areas, and the communication revolution made possible by information technology.

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founded that there was any radical change in the approach to medical education. Newcastle Medical School, in 1973, and Flinders Medical School (SA), established a year later, both came in the wake of the Karmel Report (*Expansion of medical education*),³ which recommended an increase in the number of medical undergraduates but, more importantly, a new community focus for medical education.

Although individual academic staff within medical schools have had close ties with community medicine, Newcastle and Flinders medical schools have played a major leadership role in this area. The Newcastle school, with its particular focus on community involvement, raised the standard of healthcare in the Hunter Valley area.⁴ On the other hand, the Flinders school, with Flinders Medical Centre, developed as a seamless university hospital, where academics and staff specialists cooperated in research, teaching and medical service.⁵ Few institutions in Australia have been able to emulate this achievement. However, substantial progress has been made towards incorporating non-university clinical teachers in academic departments by conferring conjoint, adjunct or associate academic titles, and teaching hospitals have been encouraged to confer similar reciprocal hospital status on university clinicians.

Apart from community involvement, two important innovations of the Newcastle medical school were inclusion of an interview in the student selection process and an

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1: Establishment of Australia's medical schools

University of Melbourne, Vic	1862	University of New South Wales, Sydney, NSW	1960
University of Sydney, NSW	1883	University of Tasmania, Hobart, Tas	1963
University of Adelaide, SA	1885	University of Newcastle, NSW	1973
University of Queensland, QLD	1936	Flinders University of South Australia, Adelaide, SA	1974
University of Western Australia, WA	1956	James Cook University, Townsville, QLD	1999
Monash University, Melbourne, Vic	1959		



Melbourne University, Old Medical School, circa 1875, courtesy The University of Melbourne Archives.

emphasis on problem-based learning.⁴ Previously, selection of medical students for university admission was based primarily on academic achievement. While academic excellence remains an important component of admission criteria, most medical schools have now introduced a structured or semi-structured interview as part of the admission process. Newcastle's problem-based curriculum was modelled on successful experiments in medical education at McMaster University in Canada over the previous 15–20 years.⁴ Most Australian medical schools have now developed a problem-based and integrated curriculum.⁶

All medical schools have faced the challenge of attracting and retaining Indigenous students. Special admission policies and support schemes have been made available, but only the Newcastle Medical School has been successful thus far.

The Doherty Report

In 1988, the Doherty Report⁷ (*Australian medical education and medical workforce into the 21st century*) identified the close relationship between medical education, funding and workforce issues and made a number of important recommendations (Box 2). This inquiry had wide terms of reference covering the whole gamut of medical education, from selection of students, through the undergraduate and pre-registration periods to training for general and specialty practice. It also considered continuing medical education, as well as the numbers, types and distribution of medical practitioners.

The committee's report has been mined and widely quoted, often to justify widely divergent positions. Some of the changes that it recommended have come to pass (eg, the establishment of a committee structure to maintain surveillance on the Australian medical workforce), some have been considered and ultimately rejected after some contro-

versy (eg, the proposal for a second year of experience after graduation and before registration), and others appear to have been ignored (eg, the recommendation that future discussions on how healthcare in Australia is delivered and paid for take account of the impact of any changes on medical education and medical workforce). In relation to undergraduate medical education, the Doherty Report supported self-directed learning, community involvement, maximal use of new technology and innovative selection methods. Unanimous support for graduate-entry medical courses was not obtained.

Graduate entry

In the mid-1990s, Flinders, Queensland and Sydney university medical schools embarked on graduate-entry courses.² Entry was by adequate performance in a previous degree program, attaining a certain level in the GAMSAT (Graduate Australian Medical School Admissions Test) or the MCAT (Medical College Admission Test),⁸ and personal qualities of the applicant assessed by structured interviews. Interestingly, several of the undergraduate schools now also have admissions tests, such as the UMAT (Undergraduate Medical and Health Science Admissions Test), which tests problem solving, creative thought and ethical reasoning.

The graduate courses have moved away from discipline-based teaching and instead organise their curricula on the basis of vertical and horizontal integration of body systems. Teaching of normal structure and function is followed by abnormal, and finally clinical presentation of diseases, while the basic sciences are integrated with clinical presentations. Although creating better learning experiences for students — and probably for staff — the process is extraordinarily labour intensive. Moreover, the traditional funding stream

to separate departments (eg, medicine, surgery, psychiatry, pathology) does not promote integrated learning.⁹ New funding models must be introduced that support integrated learning and research.

Feminisation

During the 1960s, 70s and 80s, the male:female ratio within medical schools changed significantly (see Yelland and Yelland on page 52). In the medical schools taking students directly from school, there are roughly equal numbers of male and female students, but, interestingly, in the graduate medical schools there have been slightly fewer women. However, there is still a marked male predominance among senior hospital and academic staff.

Multiculturalism

Students in Australian medical schools (like the rest of the country) represent a diverse range of ethnic backgrounds. A considerable number of students come from non-English-speaking backgrounds, which emphasises the importance of developing good communication skills during their training. A number of medical schools have also been involved in the retraining of overseas-trained doctors. These students are a valuable addition to the medical workforce in Australia, particularly in rural areas.

Curricula and assessment

In the 1950s and 60s we aimed to give graduating students a good understanding of the knowledge base of medicine. Today, producing graduates who "know it all" is impossible: just to keep up with new medical knowledge it is necessary to read about 1500 pages per day.¹⁰ What current curricula aim for is to provide students with the basic principles of health and disease, show them how to acquire knowledge and encourage this practice for the rest of their working life. We probably need to define more exactly what is meant by the "basic principles": how much of the basic sciences, molecular biology, physiology and biochemistry do medical students need to know, and what of epidemiology, psychology, ethics and the social sciences?

Most medical schools, whether graduate-entry or not, organise teaching around problem solving. These courses require a more integrated approach to learning, with an emphasis on developing problem-solving and communication skills, and produce relatively "undifferentiated" graduates, who can then develop specific discipline skills at a postgraduate level.

Forms of assessment have also diversified. Essays, short answers, multiple-choice questions in all forms and clinical examinations (including long and short cases and objective, structured clinical examinations) are still used. Continuous evaluation, particularly in the clinical years, has become increasingly important. Other forms of assessment, such as Web-based and open-book exams, are also being tried. Assessment methods for some important areas, such as ethics, and professional relationships, particularly the interaction with other health practitioners, also need to be evaluated.

Main recommendations of the Doherty Report⁷

That

- the Commonwealth Government recognise the close relationship between, on the one hand, how medical care is delivered and financed, and, on the other, how medical practitioners are trained (medical education) and their numbers and distribution (medical workforce).
- In future reviews of Australia's national health insurance system or its schedule of fees, full and careful consideration be given to the consequences, direct or indirect, that changes may have on the quality and accessibility of services and on the distribution and performance of providers.
- Clinical training of undergraduates and preregistration trainees should be carried out in a range of facilities, including teaching hospitals, general hospitals, general practices, community health centres and other community settings to ensure that at registration doctors appreciate the spectrum of health, disability and disease in the community, the relative importance of various disorders and disabilities and the extent of community resources available to handle them.
- State health departments and boards of teaching hospitals should recognise that the continued important role of teaching hospitals in undergraduate, pre-registration and specialist vocational training implies the need for staffing and other support to be maintained at levels that will be adequate for the essential teaching and research functions of such hospitals as well as their clinical functions to continue.
- Medical schools make available facilities and advice for training staff in education, including supervision and assessment, and that skills in and commitment to teaching should be given due recognition in the recruitment and promotion of staff.

Preregistration training

After the basic medical degrees, and prior to registration, medical training is now the responsibility of State health departments in all States. Although attempts are being made to develop national networks for postgraduate years 1 and 2 training, there is still diversity between the States. Unfortunately, this does lead to some fragmentation between the universities (responsible for basic medical qualifications), State governments (responsible for preregistration training) and the Colleges (responsible for specialist qualifications). Greater effort should be made in the future to bring these groups together.

Teaching locations

The enormous changes in the delivery of healthcare, in particular over the past 10 years (reductions in hospital beds and length of stay, preadmission clinics, early-discharge schemes and the move to day surgery and ambulatory care), have led to major changes in the location of learning experiences for medical students.¹¹ The large tertiary referral hospitals do not always provide the optimal learning environment for pre-registration students. Students tend to be mere spectators and have little opportunity to participate in supervised clinical decision making or gaining practical skills. Smaller hos-

pitals are now being used for student placements, and there has been an increase in the time that students spend in general practice.

Public and private hospitals are beginning to acknowledge their important role in teaching, and this role also needs to be acknowledged by their administrators and funders. An increasing number of private hospitals are being drawn into the learning network, because of their co-location with major public hospitals.¹² Graduates of the future need to learn in an environment that may be their future work environment, at least for part of the time, and postgraduate training also increasingly involves the private sector, particularly in surgical specialties. Teaching in the private sector is best done

with very small groups of students or on a one-to-one basis. Increasingly, private practitioners are being encouraged to take on students in a mentorship role and have them observe their daily practice, as has been done successfully in teaching general practice.

Rural health

The major rural health issue — the difficulty of attracting doctors and healthcare professionals to work in rural Australia — has been a significant stimulus for change. Since 1996, seven university departments of rural health have been established, including some in remote locations, such as Broken Hill, Mount Isa, Alice Springs and Geraldton.¹³

The most recent medical school established, James Cook Medical School, in Townsville, was set up specifically to provide rural learning experiences, but many of the metropolitan-based schools have been running successful rural programs, as well as encouraging intake of students from rural areas. The announcement in the 2000 Federal Budget of \$120 million to create a network of nine rural clinical schools should solve some of the problems of access to healthcare. These schools have the potential to improve health infrastructure in rural Australia and promote the concept of "healthy towns".¹⁴ Because of the importance of "team management" in rural healthcare, it is important that these clinical schools educate doctors as well as other health professionals.

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Influence of information technology

Health online is changing not only the way medicine is practised, but also the way healthcare is taught. Most medical schools now make extensive use of online educational resources, which means that rural students can access lectures, the pathology museum and library services via the Web. Medical schools are devoting considerable resources to providing online learning and some have already sold their

curricula to medical schools in other countries. Australia is particularly well situated geographically, with nearly half the world's population in our time zone (Eastern Australian Standard Time \pm 4 hours) (South-East Asia, China, India and Japan), which increases the potential for interactive learning.¹⁵

The future — postmodern healthcare

Changes in the organisation and delivery of medical education will continue so that students are equipped for coping with "postmodern" healthcare, as described by Muir Gray — a healthcare system in which a community's concern about values, as well as evidence, has to be considered.¹⁶ Healthcare professionals have to accept they are dealing with an increasing number of well informed patients and a community preoccupied with the risk rather than benefit. These characteristics of modern healthcare, according to Muir Gray, are:

- concern with health as well as healthcare (ie, prevention as well as treatment);
- evaluation of services in terms of their effectiveness, appropriateness and necessity;
- public involvement in health and healthcare policy making;
- concern with patient satisfaction and experience of care;
- commitment to continual quality assurance; and
- emphasis on accountability.

The next 50 years will be challenging times, and the challenges for medical education will be to continue to respond to changing community needs and make maximal use of new technologies so as to provide better health practitioners for the future.¹⁷

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